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EXAMINER	
SLOAN, NATHAN A	

ART UNIT	PAPER NUMBER
2614	

DATE MAILED: 05/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/484,610	ROECK ET AL.	
	Examiner	Art Unit	
	Nathan A Sloan	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *19 February 2003* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 2/25/2003 have been fully considered but they are not persuasive.

With respect to claims 1, 11, 27, and 32, applicant asserts that that "the power control signals of Kumar are neither power measurements nor derivatives of power measurements," as claimed. Clearly Leano teaches receiving cable modem signals at a head end and determining a received power measurement. This is taught by Leano as cited to applicant in the previous Office Action, in column 5, lines 13-20, further in columns 9, lines 31-40, and in detail in column 11, lines 20-30 with regard to Figure 6 which clearly shows an input power level 605 and comparator 601. Kumar is relied on in combination for teaching calculating a power adjustment using a *plurality* of power data signals. As seen in Figure 7 of Kumar, multiple power control signals are analyzed at step 711 to determine an appropriate power level at step 712. The fact that Kumar teaches analyzing a plurality of power control signals rather than a plurality of power measurements is not a patentable distinction as Leano explicitly teaches calculating a power adjustment based on a power *measurement*. The concept encompassed by Kumar is to perform a power adjustment based on a set of data over time rather than with each measurement as taught by Leano. Examiner upholds that it would have been obvious for one skilled in the art at the time of the invention to modify the single power sampling techniques taught by Leano with the

sampling of multiple power data signals as taught by Kumar in order to sample power data over time thereby avoiding large, instantaneous fluctuations in power signal.

With respect to claim 16, applicant asserts that "none of Leano and Kumar teach or suggest (b) means for calculating a single power level adjustment for the cable modem based upon a plurality of the detected power levels and (c) means for generating instructions to the cable modem to make the calculated power adjustment." As noted above, Leano in view of Kumar teach calculating a power level adjustment using a plurality of power measurements. Furthermore, Leano clearly teaches means for instruction a cable modem to make a calculated power adjustment in column 11, lines 29-31. Applicant further asserts that "because, in Kumar's system, the wireless terminal 502, *not the base station 501*, receives the power control signals b_i, *and uses them to control the transmission power of the wireless terminal 502"* the system of Kumar does not affect the patentability of Kumar. Examiner first notes that applicant clearly agrees that the system of Kumar is used to control transmission power. The fact that Kumar performs transmission power calculations based at the receiver rather than the head end is not a patentable distinction because Leano clearly teaches cable modem transmission power calculation at a head end and Kumar is relied on for the concept of controlling transmission power using a plurality of power signals. Examiner upholds that it would have been obvious for one skilled in the art at the time of the invention to modify the single power sampling techniques taught by Leano with the sampling of multiple power data signals as taught by Kumar in order to sample power data over time thereby avoiding large, instantaneous fluctuations in power signal.

Furthermore, applicant asserts that "nothing in Kumar suggest generating instructions to a downstream terminal sent from a base station." As noted above, the primary reference Leano explicitly teaches this feature.

With respect to claims 24 and 26, applicant has requested a reference be supplied regarding the Official Notice taken "since only with such references in hand can Applicants make a meaningful assessment of whether the prior art teaching of such features can be properly combined with the prior art relevant to the claims." Therefore, note columns 43-46 of McMullan, Jr. (5,225,902), Figures 6A and 6B of Chen et al. (5,943,604), both cited by applicant in the IDS filed 1/11/01, and Quigley et al. (2001/0055319). Examiner refers applicant to MPEP 2144.03 (c) which states that "To adequately traverse such a finding, an applicant must specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be common knowledge or well-known in the art." The mere fact that Applicant does not have the references "in hand" is not a sufficient statement of "why the noticed fact is not considered to be common knowledge or well-known in the art" as required by MPEP 2144.03 (c). Accordingly, the Official Notice taken regarding periodic frequency ranging is taken to be admitted prior art.

With respect to claim 25, no traversal of examiner's Official Notice regarding detection and calculation of frequency adjustments based on a plurality of frequency measurements was provided and this Official Notice is accordingly taken to be admitted prior art.

New claims 36-42 have been addressed below by Leano in view of Kumar.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leano et al. (6,453,472) and in view of Kumar et al. (6,212,399).

With respect to claims 1, 27, 36, 39, and 41, Leano et al. the claimed system and method for adjusting the power of a cable modem on a cable network, comprising "determining that cable modem signals received at or proximate a headend of the cable network fluctuate in power by more than a defined amount," in column 5, lines 13-20. Leano teaches that this method may be implemented in computer readable code in column 6, lines 32-50. Leano also teaches calculating a power adjustment using a recent power measurement of a signal from the cable modem, as well as "instructing the cable modem to adjust its power based upon the calculated adjustment in column 5, lines 40-48. Leano further teaches means for instruction a cable modem to make a calculated power adjustment in column 11, lines 29-31. Leano does not explicitly teach adjusting the power based on a *plurality* of recent power measurements. Kumar teaches in column 6, lines 37-60 analyzing the last n power signals and using statistical analysis methods including standard deviation, dispersion, or absolute value of the sum of the last n power signals. This analysis uses two pre-determined thresholds representing acceptable signal quality and thus power ranges and determines an appropriate adjustment of transmitter power. It would have

been obvious for one skilled in the art at the time of the invention to modify the power adjustment methods as taught by Leano by sampling a number of signals to determine the power levels over time as in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claim 2, the claimed "CMTS performs at least the determining and the calculating," is taught by Leano in column 5, lines 40-48.

With respect to claim 3, it is the position of the examiner that the claimed "amplitude estimator" in a CMTS used to take power measurements of signals from the cable modem inherent to the hardware configured to receive and compare a power input level from a cable modem with an adjust power level, as taught in column 9 lines 32-35 of Leano and seen in Figure 6.

With respect to claims 4 and 28, Leano does not explicitly teach determining that signals fluctuate more than a defined amount by calculating a deviation "over multiple power measurements." In column 5, lines 21-28 Leano does teach determining if the actually power level deviates from a dynamic range associated with the cable modem, but not over multiple power measurements. Kumar teaches calculating a standard deviation of multiple power signals as compared to determined thresholds using n signals in column 6, lines 37-60 on page 25, lines 1-8. It would have been obvious for one skilled in the art at the time of the invention to modify the power adjustment methods as taught by Leano by sampling a number of signals using statistical deviation to determine the power levels over time in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claim 5, Kumar teaches in column 6, lines 61-65 that n should be chosen to neither be too large and thus cause sluggish changes, or too small and thus too sensitive to transmission errors in the power control signals. It is therefore the position of the examiner that it would have been obvious to chose a number such as 8 or 16 sample in order to provide an ideal sample that adequately reflects the state of power transmission.

With respect to claim 6, the claimed "determining that signals from the cable modem fluctuate more than the defined amount comprises determining that the cable modem has been instructed to change its power level more than a threshold percentage of opportunities for adjustment" is taught by Leano by using a polling interval with a determined amount of time to adjust power levels, as taught in column 12, lines 59-65. During the polling interval the cable modem is instructed to change it's power level by increasing and decreasing power when power fluctuates more than a defined amount until the power level falls within a predetermined range. If after a polling period, claimed threshold percentage of opportunities, is complete the power level is not determined to be within the range, the polling period may be repeated to further tune the power output of the cable modem.

With respect to claims 7 and 29, the claimed "calculating an average difference between an actual power and an expected power over at least eight recent power signals at or proximate the head-end of the cable network" is not taught by Leano. Kumar explicitly teaches in column 6, lines 37-60 analyzing and comparing the last n power signals to predetermined thresholds, claimed expected power, using statistical analysis methods including standard deviation, dispersion, or absolute value of the sum of the last n power signals. It would have been obvious for one skilled in the art at the time of the invention to modify the power adjustment methods as

taught by Leano by sampling a number of signals to determine the power levels over time in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claim 8 and 30, Leano does not explicitly teach that "calculating the power adjustment comprises offsetting the average difference *by a multiple of the deviation* in actual power measurements." Examiner notes that a variety of statistical analysis methods, such as offsetting a mean by a multiple of the deviation are notoriously well known in the art. Kumar explicitly teaches in column 6, lines 37-60 analyzing and comparing the last n power signals to predetermined thresholds, claimed expected power, using statistical analysis methods including standard deviation, dispersion, or absolute value of the sum of the last n power signals. It would have been obvious for one skilled in the art at the time of the invention to modify the power adjustment methods as taught by Leano by analyzing a number of power levels with various statistical analysis to determine a power adjustment in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claim 9 and 31, the claimed calculating a power adjustment by "determining an adjustment associated with a signal to noise ratio detected for upstream signals from the cable modem," is not explicitly taught by Leano. Kumar teaches in column 2, lines 38-45 that measuring interference as a function of the amount of power used with criteria such as signal to noise ratio, bit error rate, etc are notoriously well known in the art. It would have been obvious for one skilled in the art at the time of the invention to modify the techniques taught by Leano by examining a signal to noise ratio as is notoriously well known and taught to be so by

Kumar in order to determine the current quality of signal and determine an appropriate power adjustment to maintain signal quality.

With respect to claim 10, Leano explicitly teaches adjusting power levels by sending a message from a CMTS to cable modem using well known DOCSIS standards in column 8, lines 1-13.

With respect to claims 11, 32, 37, 40, and 42, Leano teaches the claimed system and method of controlling power at which a cable modem sends data upstream on a cable network, wherein at or proximate a cable network head-end, the cable network periodically determines the power of upstream signals from the cable modem, comprising adjusting the cable modem power based on a first technique in column 5, lines 13-28. Leano teaches that this method may be implemented in computer readable code in column 6, lines 32-50. Leano teaches adjusting power if the signal contains "more than a threshold level of noise or fluctuation" by comparing the power level received with a desired power level in a periodic ranging request in column 10, lines 31-40. Leano further teaches means for instruction a cable modem to make a calculated power adjustment in column 11, lines 29-31. Leano does not explicitly teach "adjusting the cable modem power based upon a second technique that *averages* recent cable modem power measurements." Kumar teaches in column 6, lines 37-60 analyzing the last n power signals and using statistical analysis methods including standard deviation, dispersion, or absolute value of the sum of the last n power signals. This analysis uses two pre-determined thresholds representing acceptable signal quality and thus power ranges and determines an appropriate adjustment of transmitter power. It would have been obvious for one skilled in the art at the time of the invention to modify the power adjustment methods as taught by Leano by sampling a

number of signals to determine the power levels over time in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claims 12 and 33, the claimed first technique of claims 11 and 32 comprising determining a difference between actual and expected power of a cable modem signal and instructing a power change based on the difference is explicitly taught by Leano in column 9, lines 31-48.

With respect to claims 13 and 34, the claimed second technique of claims 11 and 32 comprising "calculating a power adjustment based upon a *plurality of* recent differences between actual and expected power of upstream signals" and instructing an power adjustment based on the calculated adjustment is not explicitly taught by Leano. Kumar teaches calculating a standard deviation of multiple power signals as compared to determined thresholds using n signals in column 6, lines 37-60 on page 25, lines 1-8. It would have been obvious for one skilled in the art at the time of the invention to modify the power adjustment methods as taught by Leano by sampling a number of signals using statistical deviation to determine the power levels over time in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claim 14, Leano explicitly teaches using ranging requests to track power levels in column 8, lines 40-45 and conforming to well known DOCSIS standards in column 8, lines 1-13.

With respect to claim 15 and 35, Leano teaches "determining that the upstream signals from the cable modem contain less than the threshold level of noise" by determining and comparing the signal with determined levels as noted above. As seen in Figure 5, an initial

ranging 503 occurs to setup cable modems at predetermined transmission levels. Once the initial ranging is completed and a cable modem power level is set, normal period ranging 505 is used, claimed "first technique for adjust the cable modem power." Although Leano does not explicitly teach *returning* to the first technique, examiner notes that it is often the case that cable modem will be in normal periodic ranging and go into an offline state as a result of being disconnected from the network. Upon reconnection the cable modem undergoes initial ranging again, after which ranging techniques *return* to normal ranging.

With respect to claims 16 and 19, Leano explicitly teaches a cable modem termination system with receiver used to receive signals and determine input power levels in column 5, lines 34-47. Leano also teaches a processor used to calculate a power adjustment based on a recent power measurement of a signal from the cable modem, as well as "means for generating instructions to the cable modem to make the calculated power adjustment" in column 8, lines 48-65. Leano does not explicitly teach means for calculating a single power adjustment based on a *plurality* of recent power measurements. Kumar teaches in column 6, lines 37-60 analyzing the last n power signals and using statistical analysis methods including standard deviation, dispersion, or absolute value of the sum of the last n power signals. This analysis uses two pre-determined thresholds representing acceptable signal quality and thus power ranges and determines an appropriate adjustment of transmitter power. It would have been obvious for one skilled in the art at the time of the invention to modify the CMTS system as taught by Leano by sampling a number of signals to determine the power levels over time in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claim 17, the claimed receiver that determines a difference between detected and expected power levels and calculates a single power adjustment based on the difference is taught by Leano in column 9, lines 31-48. Leano does not explicitly teach calculating a single power adjustment based upon a *plurality* of detected power levels. Kumar teaches calculating a standard deviation of multiple power signals as compared to determined thresholds using n signals in column 6, lines 37-60 on page 25, lines 1-8. It would have been obvious for one skilled in the art at the time of the invention to modify the CMTS system as taught by Leano by sampling a number of signals using statistical deviation to determine power adjustment in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claim 18, the claimed receiver being hardware is seen in Figure 2 as item 200 of Leano. The claimed software used to calculated and generate instructions is taught by Leano in column 5, lines 50-59.

With respect to claim 20, Leano does not explicitly teach that "calculating the power adjustment comprises offsetting the average difference *by a multiple of the deviation* in actual power measurements." Examiner notes that a variety of statistical analysis methods, such as offsetting a mean by a multiple of the deviation are notoriously well known in the art. Kumar explicitly teaches in column 6, lines 37-60 analyzing and comparing the last n power signals to predetermined thresholds, claimed expected power, using statistical analysis methods including standard deviation, dispersion, or absolute value of the sum of the last n power signals. It would have been obvious for one skilled in the art at the time of the invention to modify the power adjustment methods as taught by Leano by sampling a number of signals to determine the power

levels over time in order to "prevent unnecessarily wild fluctuations in the radiated power" as taught by Kumar in column 7, lines 8-11.

With respect to claim 21, the claimed calculating a power adjustment by "determining an adjustment associated with a signal to noise ratio detected for upstream signals from the cable modem," is not explicitly taught by Leano. Kumar teaches in column 2, lines 38-45 that measuring interference as a function of the amount of power used with criteria such as signal to noise ratio, bit error rate, etc are notoriously well known in the art. It would have been obvious for one skilled in the art at the time of the invention to modify the techniques taught by Leano by examining a signal to noise ratio as is notoriously well known and taught to be so by Kumar in order to determine the current quality of signal and determine an appropriate power adjustment to maintain signal quality.

With respect to claim 22, Leano explicitly teaches using ranging requests to track and adjust power levels in column 8, lines 40-45 and conforming to well known DOCSIS standards in column 8, lines 1-13.

With respect to claim 23, Leano teaches the claimed "determining whether signals from a cable modem contain more than a threshold level of noise" in column 5, lines 51-59 by comparing input power level signals at the head end to predefined levels to minimize non-recognition (as a result of noise) of the cable modem. It is well known that maintaining ideal output power levels directly correlates to minimizing noise in a signal.

With respect to claims 24 and 26, Leano et al. teach "method of adjusting the power of a cable modem on a cable network, the method comprising determining that cable modem signals received at or proximate a headend of the cable network fluctuate in power by more than a

defined amount," in column 5, lines 13-20. Leano also teaches calculating a power adjustment using a recent power measurement of a signal from the cable modem, as well as "instructing the cable modem to adjust its power based upon the calculated adjustment in column 5, lines 40-48. Leano does not teach this system and method in the field of frequency adjusting using a plurality of measurements. The process of performing periodic ranging by signal sampling is well known to be applied to both power and frequency level setting techniques. To these means, Kumar teaches in column 6, lines 37-60 analyzing the last n power signals and using statistical analysis methods including standard deviation, dispersion, or absolute value of the sum of the last n power signals. This analysis uses two pre-determined thresholds representing acceptable signal quality and thus power ranges and determines an appropriate adjustment of transmitter power. Examiner takes Official Notice that it is well known in the industry to perform periodic ranging for frequency selection, including examining a plurality of recent measurements and calculating deviations from a desired frequency. It would have been obvious for one skilled in the art at the time of the invention to modify the transmission level setting techniques as taught by Leano and Kumar by sampling a number of signals to determine the frequency levels over time in order to minimize the signal to noise ratio.

With respect to claim 25, the claimed "CMTS performs at least the determining and the calculating," is taught by Leano in column 5, lines 34-48. Although Leano does not explicitly teach periodic ranging for frequency selection, examiner takes Official Notice that it is well known in the art to detect and calculate frequency adjustments based on a plurality of frequency measurements. It would have been obvious for one skilled in the art at the time of the invention

to modify the system taught by Leano and Kumar by performing frequency selection in addition to power selection in order to optimize transmission.

With respect to claim 38, Leano teaches means for instruction a cable modem to make a calculated power adjustment in column 11, lines 29-31. It would have been obvious for one skilled in the art at the time of the invention to utilize the same power adjustment instruction techniques for frequency adjustment in order to ensure proper frequency selection of upstream transmission.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Quigley et al. (2001/0055319) teach a system and method to control upstream data transmission from cable modems, including ranging processes involved with both frequency and power requirements.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A Sloan whose telephone number is (703)305-8143. The examiner can normally be reached on Monday-Friday from 8:00AM to 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller, be reached on (703) 305-4795. The fax phone number for the organization where this application or proceeding is assigned is (703)308-5399.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-3900.

MICHAEL H. LEE
PRIMARY EXAMINER